QUALITY ASSURANCE

and

QUALITY CONTROL

PROCESS

GUIDE

for

PROJECT MANAGERS

MDOT Trunkline Projects
January 2005
# TABLE OF CONTENTS

Discussion ............................................................................................................. 2

Scope Verification Meeting .................................................................................. 3  
  • Overview ....................................................................................................... 3  
  • Procedure .................................................................................................... 4  
  • Requirements .............................................................................................. 5  
  • Reference Material ...................................................................................... 5

Base Plan Review (OPTIONAL) .......................................................................... 6  
  • Overview ....................................................................................................... 6  
  • Procedure .................................................................................................... 7  
  • Requirements .............................................................................................. 7  
  • Reference Material ...................................................................................... 8

The Plan Review Meeting ..................................................................................... 9  
  • Overview ....................................................................................................... 9  
  • Procedure .................................................................................................... 10  
  • Requirements .............................................................................................. 11  
  • Reference Material ...................................................................................... 11

Errors and Omissions Check (OEC) Meeting ...................................................... 13  
  • Overview ....................................................................................................... 13  
  • Procedure .................................................................................................... 13  
  • Requirements .............................................................................................. 14  
  • Reference Material ...................................................................................... 14

Final Package Submittal ....................................................................................... 15  
  • Overview ....................................................................................................... 15  
  • Procedure .................................................................................................... 15  
  • Requirements .............................................................................................. 15  
  • Exceptions ................................................................................................... 16  
  • Exceptions-Procedure .................................................................................. 16  
  • Reference Material ...................................................................................... 16

Quality Control Activities .................................................................................... 18  
  • Overview ....................................................................................................... 18  
  • Procedure .................................................................................................... 18  
  • Requirements .............................................................................................. 18  
  • Reference Material ...................................................................................... 18

Appendix A: Reference Documents .................................................................... 19
MDOT QA/QC PROCESS FOR TRUNKLINE PROJECTS

Discussion
The MDOT Quality Assurance/Quality Control (QA/QC) process for trunkline projects is based on a well-documented plan development procedure. It applies to both in-house and consultant designed projects, as well as road and bridge projects. The procedure includes periodic reviews at pre-determined stages during the design of the project. The Quality Control (QC) includes a plan development process that is described in Chapter 14 of the Road Design Manual and also in the Program/Project Management System (PPMS) Task Manual. Both manuals provide a detailed and chronological procedure for the development of design plans. The procedure ensures all the required elements are effectively incorporated into the project. The Quality Assurance (QA) consists of 5 distinct stages at which an independent team comprehensively reviews the content and accuracy of the plans and proposal. The four stages are the Scope Verification Meeting, the Plan Review Meeting, the Omissions and Errors Check (OEC) Meeting, and the Final Project Turn-in as shown below. All projects do not require each of the 5 stages. For instance, a Base Plan Review is not required on any projects. To determine the process required on a project, reference should be made to the Table titled “QA/QC Review Process by Template”. In addition, the complete project development network should be reviewed for a thorough understanding of the entire plan development process.
SCOPE VERIFICATION MEETING

Overview
Once a project is assigned, the Project Manager should request from the office that scoped the project, a copy of the scoping documents. These documents may include such items as a completed copy of the Project Scoping Checklist, project concept statement, pavement coring information, cost estimate, sketch of the proposed typical cross section(s), and preliminary survey. The initial PPMS Network should also be available. The Project Manager will then gather the necessary old plans, utility information, traffic data, and other useful background information, review all scoping documents, and review cost estimates from the programming of the project and compare it to the programmed cost. If this review of the estimate differs significantly from the programmed cost, the Project Manager should discuss possible revisions such as increasing the programmed cost, changing the scope of work and/or reducing the project limits with the System Manager and/or TSC Manager prior to the Scope Verification Meeting. Attendees of the Scope Verification Meeting should be informed of any revisions at the meeting to minimize design time impacts and to avoid a possible delay of the project.

When sufficient information is available, the Project Manager will schedule a Scope Verification Meeting. In order to ensure that everyone understands and agrees with the proposed scope of work, it is essential that all the disciplines and work centers that will be involved in the development of the project be invited to this meeting. This will minimize possible “scope creep” and reduce the number of redesigns by verifying and documenting the scope of work as early as possible in the design process.

Prior to this meeting, the Project Manager should establish the role of the Federal Highway Administration (FHWA) on the project. The oversight responsibility can be determined by referring to the Agreement between the Michigan Department of Transportation and the Federal Highway Administration for Administration and Oversight of Federal-Aid projects. Any uncertainty regarding this determination should be clarified by discussing the project with the FHWA Area Engineer.

Also, at this stage, the Project Manager should verify that the Pavement Design and Selection Policy has been followed. Depending on the type of fix and estimated paving cost, a Life Cycle Cost Analysis (LCCA) may be required. If the procedure has not been followed, the Project Manager should contact the Pavement Design Engineer or appropriate Region/TSC Soils Engineer to initiate compliance with the policy.

Items to be discussed at the Scope Verification Meeting may include:

- Cost estimate
- Project description
- Project limits
- Environmental impacts and mitigation measures
- Hazardous waste coordination
- Project schedule
- Safety review
- Soils information
- Pavement information
- Geometrics
- Right-of-Way
- Utilities
- Political considerations
• Traffic maintenance during construction
• Waterway crossings
• Railroad crossings
• Crash analysis
• Affected flood plains
• Design exceptions and Crash Analysis
• Incentive/disincentive clauses
• Construction staging/Detour (all routes)
• Local agreements
• Warranties
• Lane Rentals
• Night Work

• Expedited schedules
• Packaging with other projects
• Traffic data
• Underclearance
• Local coordination
• Traffic signals
• Drainage
• FHWA status
• Survey
• STIP/TIP
• MDOT/Consultant design
• Context Sensitive Solutions
• Multi Modal

Procedure
The Project Manager should:
1. Receive project assignment.
2. Input actual start date (PPMS Task No. 3130) into the appropriate data system.
3. Collect all the available information concerning the project for distribution prior to, or at, the meeting.
4. Identify meeting attendees and schedules meeting. Attendees may include:
   • FHWA/MDOT oversight
   • Design unit
   • Environmental
   • Geometrics (Central Traffic and Safety)
   • Construction
   • Locals
   • Central Specialty Units
   • Region/TSC
      Traffic and Safety
      Soils/Materials
      Utilities/Permits
      Delivery/Resident Engineer
      Maintenance
      Real Estate (if applicable)
      Survey (if applicable)
      Associate Region Engineer – Development Businesses
      Cost & Scheduling Engineer
      TSC Manager
      TSC Development Engineer
      Region/TSC/Central Bridge Design Engineer
5. Distribute the information to verify the scope of work.
6. Conduct meeting.
7. Review scope of work agreed upon at meeting with programmed scope and cost.
8. If significantly different, discuss with TSC Manager and/or System Manager and, if necessary, submit a Change Request (2604) to revise scope and/or cost.
9. Write and distribute meeting minutes to all those invited to the meeting. The Region System Manager/Associate Region Engineer-Development and the Environmental Section in the Bureau of Transportation Planning must always receive copies of these minutes.
10. Input actual finish date (PPMS Task No. 3130) into the appropriate data system.

Requirements

- Old plans and/or a sketch of the proposed typical for the work
- Pavement core/soil boring information
- Utility information
- Traffic data
- Project Concept statement
- Cost estimate
- Environmental Study form
- PPMS network
- Right-of-Way Plans
- Scoping documents
- Structure information
- Scour information
- Other useful background information

Reference Materials
Plan Development Services Website
QA/QC Review Process by Template
Road Design Manual – Section 14.10
Bridge Design Manual – Section 2.02.15
PPMS Task Manual – Task Number 3130
PPMS Global Network
Agreement between the Michigan Department of Transportation and the Federal Highway Administration for Administration and Oversight of Federal-Aid projects
Design Guidelines
Design Standards
Scope Verification Checklist
Requirements for Preliminary Right-of-Way
BASE PLAN REVIEW MEETING (Optional)

Overview
The purpose of the Base Plan Review Meeting is to ensure the project design is proceeding according to the scope of work agreed to at the Scope Verification Meeting. Base Plan Review Meetings are not required, but may be scheduled at the discretion of the Project Manager. These meetings may be held on projects designed in-house or those designed by consultants. The meeting and corresponding field review should be conducted by the MDOT Project Manager.

A minimum of four weeks should be allotted from the time of request to the desired date of the meeting. This allows ample time to schedule the meeting, distribute plans and other materials and for review of the plans prior to the meeting. Instances when projects require a compressed schedule or scheduling without plans should be kept to a minimum.

Items to be discussed at the Base Plan Review Meeting may include:

- Plan conformance to the MDOT Drafting Standards, that the plans are readable, are organized properly and that their intent is clearly definable.
- Location/limits
- Scheduled completion
- Project cost
- Scope of work
- Right-of-Way
  - any purchase required
  - any grading permits required
  - any encroachments
  - monument preservation
- Utilities
  - identify conflicts or problems
  - discuss whether a separate meeting will be required
- Maintaining traffic/Construction staging
  - discuss whether a separate meeting will be required
  - discuss basic traffic control scheme
  - discuss minimum lanes to remain open during construction
  - discuss detour route/agreement signed
  - discuss coordination with other projects
- Signals/Signing/Pavement Markings
  - note locations of signals/loops/signs that will conflict with construction
  - determine if signal work will be included
  - determine if signing work will be included
  - determine the need for temporary signals
- Soils
  - discuss locations of contaminated sites (information obtained from the Phase 1 evaluation, aka the “Project Area Contamination Survey”-PACS)
  - discuss the need for a Phase 2 evaluation (aka the “Project Site Investigation –PSI)
-discuss locations of poor soils with recommendations

- Drainage
  - discuss erosion problems (>2% grade to ditch)
  - discuss culvert work/extensions – permits required
  - discuss drainage and vicinity map required
  - discuss hydraulic needs
  - discuss storm sewer and outlet(s)

- Surveys
  - identify problems or additional needs

- Geometrics
  - superelevations required
  - intersection radii/curb type problems
  - design exceptions required
  - crash analysis
  - guardrail and barrier wall

- Environmental
  - wetland involvement/problems
  - environmental clearance
  - permits required/impacts

Structures
  - coordination

- Railroads
  - agreements
  - coordination

**Procedure**
The Project Manager should:

1. Verify that all the applicable items on the Requirements for the Base Plan Review Meeting are included in the plans. Refer to the Consultant Manual for Consultants – Chapter 24 – PPMS Task 3360 – Part 2 – Section H – Under Prepare Base Plan Submittal Package.
2. Verify that PPMS Task No. 3380 Start Date is entered.
3. Review cost and schedule of the project and compare with approved programming documents.
4. Set up meeting and distribute the material for the meeting.
5. Review all the distributed material and prepare for the meeting.
6. Attend the meeting (the Project Manager is to run the meeting)
7. Document all the necessary information
8. Verify PPMS Task No. 3380 Finish Date is entered.

**Requirements**
- plans – including road, bridge, signals, signing, etc.
- preliminary maintaining traffic concept
- latest cost estimate and programmed cost
Reference Materials
Plan Development Services Website
QA/QC Review Process by Template
PPMS Task Manual – Task Number 3380
Requirements for The Base Plan Review Meeting – Road
Requirements for The Structure Study Review Meeting – Bridge
Requirements for Final Right-of-Way
THE PLAN REVIEW MEETING

Overview
The purpose of the Plan Review Meeting is to ensure the project design is proceeding according to the scope of work agreed to at the Scope Verification Meeting. All trunkline projects with templates requiring a Plan Review as defined in the Table QA/QC Review Process by Template must have a Plan Review Meeting. This includes projects designed in-house and those designed by consultants. The meeting and corresponding field review should be conducted by Quality Assurance and Lettings personnel. However, when staffing cannot accommodate the project schedule, a Project Manager or System Manager may arrange to conduct the meeting. In those instances when Quality Assurance and Lettings personnel cannot hold the meeting or, if the project schedule does not allow adequate time for a meeting to be held, Quality Assurance and Lettings will complete the Exception to the Plan Review Meeting/OEC Meeting Process form and forward a copy to the Project Manager. This form should be placed in the project file. Also, a copy of the meeting minutes of Plan Review Meetings conducted by a Project Manager of System Manager must be sent to Quality Assurance and Lettings. A minimum of four weeks should be allotted from the time of request to the desired date of the meeting. This allows ample time to schedule the meeting, distribute plans and other materials and for review of the plans prior to the meeting. Instances when projects require a compressed schedule or scheduling without plans should be kept to a minimum.

Items to be discussed at the Plan Review Meeting may include:

- Location/limits
- Scheduled completion
- Project cost
- Scope of work
- Right-of-Way
  - any purchase required
  - any grading permits required
  - any encroachments
  - monument preservation
- Utilities
  - any conflicts or problems
  - separate meeting scheduled/required
- Maintaining traffic/Construction staging
  - separate meeting scheduled
  - basic traffic control scheme
  - minimum lanes to remain open during construction
  - detour route/agreement signed
  - coordination with other projects
- Signals/Signing/Pavement Markings
  - signals/loops that conflict with construction
  - signal work included and/or separate contract
  - signing work included and/or separate contract
  - pavement marking included/separate contract
- temporary signals
- rumble strips

- Soils
  - contaminated sites identified
  - additional soil borings needed
  - roadside seeding/slope restoration checked by Lansing Roadside Development
  - location of poor soils with recommendations and proposed fixes
  - pavement cores

- Drainage
  - erosion problems (>2% grade to ditch)
  - culvert work/extensions – permits required
  - drainage and vicinity map required
  - hydraulic needs
  - storm sewer and outlet(s)

- Surveys
  - identify problems or additional needs

- Geometrics
  - superelevations required
  - intersection radii/curb type problems
  - design exceptions required
  - crash analysis
  - guardrail and barrier wall

- Environmental
  - city/county/township noise ordinances
  - wetland involvement/problems
  - environmental clearance
  - permits required/impacts
  - erosion control items on plans

- Local Agency
  - cost participation (100%)
  - agreements
  - Act 51

- Structures
  - coordination

- Railroads
  - agreements
  - coordination

Procedure
The Project Manager should:
1. Refer to the Table QA/QC Review Process by Template to verify the project must have a Plan Review Meeting.
2. Verify that all the applicable items on the Requirements for the Plan Review Meeting are included in the plans.
3. Contact Quality Assurance and Lettings to set up an available date for the meeting. If a Quality Assurance Engineer is not available, identify the person
who will conduct the meeting. Request a completed *Exception to the Plan Review Meeting/OEC Meeting Process form be forwarded for insertion into the project files.*

4. Request to schedule THE Plan Review Meeting through Quality Assurance and Lettings using *form No. 0200 – Plan Review Meeting.* Include all items required for distribution.

5. Verify that PPMS Task No. 3590 Start Date is entered.

6. Review cost and schedule of the project and compare with approved programming documents.

7. Request all Design Package Evaluations (DPE) be completed prior to the meeting.

8. Review all the distributed material and prepare for the meeting.

9. Attend the meeting.

10. Coordinate with the Quality Assurance Engineer to ensure all outstanding issues are resolved.

11. Document all the necessary information in the meeting minutes (if the meeting is conducted by the Project Manager).

12. Distribute the meeting minutes. If a person other than a Quality Assurance Engineer conducts the meeting and writes the meeting minutes, a copy of those minutes must be sent to Quality Assurance and Lettings.

13. Verify PPMS Task No. 3590 Finish Date is entered.

**Requirements**

- plans – including road, bridge, signals, signing, etc.
- guardrail worksheets
- preliminary maintaining traffic scheme
- latest cost estimate and programmed cost
- preliminary copies of project specific special provisions
- design exceptions with Crash Analysis
- preliminary construction staging plan/critical path

**Reference Materials**

- Plan Development Services Website
- QA/QC Review Process by Template
- Exception to the Plan Review Meeting/OEC Meeting Process
- Road Design Manual - Section 14.36
- Bridge Design Manual – Section 2.02.16
- PPMS Task Manual – Task Number 3590
- Requirements for THE Plan Review Meeting – Road
- Requirements for THE Plan Review Meeting – Bridge
- Request for Plan Review Meeting
- Title Sheet Checklist
- Note Sheet Checklist
- Existing Typical Cross Section Checklist
- Proposed Cross Section Checklist
Removal Sheet Checklist
Construction Sheet Checklist
Profile Sheet Checklist
OMISSIONS and ERRORS CHECK (OEC) MEETING

Overview
The purpose of the Omissions and Errors Check Meeting is to review the final plan/proposal package to ensure the package is complete. All trunkline projects with templates requiring an OEC Meeting as defined in the Table QA/QC Review Process by Template must have an OEC Meeting. If Quality Assurance and Lettings personnel cannot review the project, a completed Exception to the Plan Review Meeting/OEC Meeting Process form will be forwarded to the Project Manager to be placed in the project files.

The number of participants at this meeting should be kept to a minimum. A large number of participants results in longer meetings and also promotes requests for additions or changes to the scope of work. The Project Manager can minimize the number of participants by coordinating and resolving most outstanding issues directly with others prior to the meeting. Participants at the meeting should focus only on omissions and errors in the package. Changes to the scope of work or project limits should not be considered at this stage except for in the most extreme circumstances.

Note: If the project schedule does not allow for a meeting to be held, the Project Manager should request a completed Exception to the Plan Review Meeting/OEC Meeting Process form for insertion into the project file

Procedure
The Project Manager should:
1. Refer to the Table QA/QC Review Process by Template to determine if the project requires an Omissions and Errors Check (OEC) Meeting.
2. Verify the plan/proposal package is 100% complete (see requirements below).
3. Input actual start date (PPMS Task No. 3870) into the appropriate data system.
4. Identify meeting attendees and schedule meeting. Attendees should include:
   - Project Manager
   - Designer (road and/or Bridge)
   - Quality Assurance Engineer
   - Resident/Delivery Engineer
   - Author of Maintaining Traffic Special Provision
   - Central Geometrics
   - Central Construction and Technology
   - FHWA (oversight)
   - Note: additional people may be invited if an outstanding issue requires clarification
5. Distribute plan/proposal package to all people involved in the project including those who sign or initialize the Certification Acceptance form (allow for 10 business day review time for participants)
6. Review cost and schedule of project and compare with approved programming documents
7. Request all Design Package Evaluations (DPE) be completed
8. Hold Meeting
(a) Sign the Certification Acceptance Form  
(b) Project Manager and Resident Engineer sign Title Sheet

9. Ensure all recommendations are incorporated into the plan/proposal package  
10. Input actual finish date (PPMS Task No. 3870) into the appropriate data system. 
11. Complete and forward a copy of the Submission of Final Plan/Proposal Package to Quality Assurance and Lettings to verify an OEC Meeting has been held and the project has been completed (shelf projects only).

Requirements
Plans – 100% Complete
- Final quantities  
- Special details  
- Title Sheet signed by Project Manager and Delivery Engineer  
- Title Sheet stamped by Consultant firm(s) if applicable

Proposal – 100% Complete
- Maintaining traffic special provision  
- All coordination clauses  
- All permits  
- Transport files complete with bid-based price report  
- All Frequently Used Special Provisions (FUSP)  
- All Frequently Used Supplemental Specifications (FUSS)  
- Notice to Bidders - checklist  
- All project specific special provisions (with C&T Support Area approval)  
- All Notices to Bidders – project specific  
- Right-of-Way certification  
- Utility relocation status report

Others
- Critical path network (if required)  
- Progress Clause (to be presented at the meeting by the Delivery Engineer)  
- Approved Design Exceptions  
- Local agreements  
- Road Cost Estimating Checklist  
- Bridge Lump Sum Worksheet  
- Final QA/QC Checklist

Reference Materials
Plan Development Services Website  
QA/QC Review Process by Template  
Road Design Manual - Section 14.54  
Bridge Design Manual – Section 2.02.18  
PPMS Task Manual – Task Number 3870  
Exception to the Plan Review Meeting/OEC Meeting Process
**FINAL PACKAGE SUBMITTAL**

**Overview**
The final plan/proposal package should be submitted to the Specifications and Estimates Unit on or before the date listed under the “turned in to S&E Unit” date in the fiscal year’s schedule of Letting Dates and Board Dates. Prior to submitting the package to Specifications and Estimates, the Project Manager should complete a thorough review of the entire project. At a minimum, the package must include all the items listed on the Submission of Final Plan/Proposal Package (Form No. 0269). In addition the Project Manager should ensure the items listed on the Final QA/QC Checklist have been performed.

**Procedure**
The Project Manager should:
1. Refer to the *Table QA/QC Review Process by Template* to determine if the project requires a Project Review by QA prior to turn in.
2. Determine the date, depending on the allowable advertising period, required for turn in by referencing the fiscal year’s *Letting Dates and Board Dates*.
3. Review the package to insure all the required items are included.
4. Complete and sign the Final QA/QC Checklist
5. Verify STIP/TIP/Environmental Clearance status
6. Verify the cost in Transport is ≤ the approved programmed cost
7. Submit the package to the Specifications and Estimates unit.

**Requirements**
- One print of the Title Sheet
- Bid Based Price Report (Transport) with any cost changes noted
- Submission of Final Plan/Proposal Package
- Advertising Data
- Proposal level cost summary (Transport)
- Unique Special Provisions (approved)
- Maintaining Traffic Special Provision
- Frequently Used Special Provisions (FUSP)
- Frequently Used Supplemental Specifications (FUSS)
- All required permits
- Utility Relocation Status Report
- Utility Charge Estimate
- Right-of-Way Certification for Advertising
- Coordination Clauses
- Certification and Acceptance Forms
- Notices to Bidder (insurance, warranties, contact person, projects in area, etc)
- Progress Clause
- Road Estimating Checklist
- Bridge Lump Sum Worksheet
- Design Exceptions (if applicable)
- Exception with Risk Analysis (if applicable)
• Notice to Bidders checklist
• Railroad Agreement
• Local Agreements
• STIP/TIP
• Environmental Clearance
• Final QA/QC checklist

Exceptions
There are some allowable exceptions to the minimum requirements for submittal of plan/proposal packages to the Specifications and Estimates Unit. Exceptions are permitted on the following items
• Permits
• Right-of-Way Certification on non-federally funded projects
• Local Agency agreements
• **Unique Special Provisions**

**Although unique Special Provisions are one of the allowable exceptions, it is rarely enforced. However, Project Managers should make every attempt to get approvals prior to project submittal. Special Provisions pertaining to lane rentals, ramp rentals, A+B, and changes to the Schedule of Liquidated Damages in the Standard Specifications for Construction do require approval from Construction and Technology Support Area prior to advertisement.**

Procedure - Exceptions
The Project Manager should:
1. Identify an item will not be available for inclusion in the plan/proposal package at the time of submittal.
2. Verify the item is eligible for the Exception process.
3. Investigate the status of the item to ascertain the expected date of receipt of the item.
4. Perform a risk analysis to determine the probability of the receipt of the item within the anticipated time frame, and the impact to the project both in terms of cost and schedule.
5. Send the information to the Region Engineer with a request for a signed memorandum accepting the risk and approving the project to go forward without the item.
6. Insert the signed memorandum with an attached Risk Analysis into the plan/proposal package.
7. If the exception is for a permit or ROW, include a Notice to Bidders that includes the projected date of approval and any restrictive conditions.

Reference Materials
Plan Development Services Website
QA/QC Review Process by Template
Road Design Manual – Section 14.60
PPMS Task Manual – Task Number 3910
Utility Relocation Status Report - CPM
Utility Charge Estimate
Certification and Acceptance – Type 2
Advertising Data
Certification and Acceptance – Type 1
Road Design Cost Estimating Checklist
Submission of Final Plan/Proposal Package
Certification and Acceptance – Type 3
Right-of-Way Certification for Advertisement (Improvements)
Right-of-Way Certification for Advertisement (No Improvement)
Environmental Clearance
Utility Relocation Status Report
Design Exception
Structure Lump Sum Item Worksheet
Agreement between the Michigan Department of Transportation and the Federal
Highway Administration for Administration and Oversight of Federal-Aid projects
FY Letting Dates and Board Dates
FY Letting Dates and Board Dates – Capital Preventive Maintenance Projects Only
FY Letting Dates and Board Dates – Maintenance Funded Projects Only
FY 6 Week Advertisements
Final QA/QC checklist
Risk Analysis – Local Agency Agreement
Risk Analysis – Permits
Risk Analysis – M Funded Right-of-Way
Risk Analysis – Special Provisions
QUALITY CONTROL ACTIVITIES

Overview
Quality control activities should be conducted throughout the course of the project. Calculations, estimates, etc. must be checked immediately so that errors are not perpetuated. The checker must have a similar or greater level of experience as the originator, should be a member of the project team familiar with the details of the project, and must be familiar with the type of work proposed for the project.

Procedure
The originator should:
1. Label every sheet with the control section, job number, if known, or project location, personal initials, and date.
2. List all assumptions and provide reference materials. Enough descriptions and reference materials are given such that the calculations can be checked without asking the originator any questions.

The checker should:
1. Note items that are correct with yellow.
2. Show corrections that need to be made in red.
3. Return the calculations to the originator.

The originator should then:
1. Make corrections.
2. Provide the checker with revised calculations and the original comments from the checker.

The checker should then:
1. Ensure that all comments have been addressed.
2. Provide personal initials and date on every sheet that has been checked.

If checker and originator cannot resolve a disagreement, the project manager makes the final decision.

Requirements
- List all assumptions
- Provide appropriate reference materials
- Show all work
- Provide stationing limits where possible
- Back up calculations in spreadsheets must be provided

Reference Materials
Road Design Manual
Bridge Design Manual
Drainage Manual
Design Reference Site
APPENDIX A: Reference Documents

Copies of the following documents are included. Documents followed by a number in parenthesis are official forms. When completing these forms, Project Managers should access the Plan Development Services website to get the latest version. Most of the other documents are available on the Plan Development Services website. Many are in the process of being converted to official forms.

NOTE: Copies are not included here but may be found Plan Development Services website.

- Advertising Data (#0256)
- Agreement between the Michigan Department of Transportation and the Federal Highway Administration for Administration & Oversight of Federal-Aid projects
- Alignment (Information required on Plan Sheets) Checklist
- Capital Preventive Maintenance Project/M-Funded Project Checklist
- Certification and Acceptance – Type 1 (#0265)
- Certification and Acceptance – Type 2 (#0253)
- Certification and Acceptance – Type 3 (#0301)
- Construction Sheet Checklist
- Design Exceptions (#FC26)
- Environmental Clearance (#1775)
- Exception to the Plan Review/OEC Meeting Process
- Existing Typical Cross Section Checklist
- Final QA/QC Checklist
- FY Letting Dates and Board Dates
- FY Letting Dates and Board Dates–Capital Preventive Maintenance Projects Only
- FY Letting Dates and Board Dates – Maintenance Funded Projects Only
- FY 6 Week Advertisements
- Note Sheet Checklist
- Plan Completion Checklist
- Profile Sheet Checklist
- Project Scoping Checklist
- Proposed Cross Section Checklist
- QA/QC Review Process by Template
- Removal Sheet Checklist
- Request for Plan Review Meeting (#0200)
- Requirements for Preliminary Right-of-Way Plans
- Requirements for Final Right-of-Way Plans
- Requirements for THE Plan Review Meeting – Road
- Requirements for THE Plan Review Meeting – Bridge
- Right-of-Way Certification for Advertising (Improvements) (725I)
- Right-of-Way Certification for Advertising (No Improvements) (725N)
- Risk Analysis – Local Agency Agreement
- Risk Analysis – Permits
- Risk Analysis – M Funded Right-of-Way
- Risk Analysis – Special Provision
• Road Design Cost Estimating Checklist (#0268)
• Structure Lump Sum Item Worksheet (#2911)
• Submission of Final Plan/Proposal Package (#0269)
• Title Sheet Checklist
• Utility Charge Estimate(#0223)
• Utility Relocation Status Report(#2286)
• Utility Relocation Status Report - Capital Preventive Maintenance Projects Only
• Utility Relocation Status Report – Pavement Marking Projects Only